

Customer No.: 31561

Docket No.: 13155-US-PA

Application No.: 10/711,003

In The Claims:

1. (currently amended) A method of fabricating a shallow trench isolation structure for reducing wafer ~~scratch~~ ~~scratchreducing-wafer-scratch~~, comprising the steps of:

providing a substrate; and

performing a laser marking processing operation over a surface of the substrate prior to performing a chemical mechanical polishing process, wherein at least a protrusion is formed over the surface of the substrate during the laser marking processing operation, and wherein ~~a parameter~~ an energy of an laser beam of the laser marking processing operation is adjusted ~~in a manner to reducing~~ reduce a step height of the protrusion compared to that without adjusting the parameter of the processing operation.

Claims 2-3. (canceled)

4. (currently amended) The method of ~~reducing-wafer-scratch~~ of claim 3 1, wherein the energy of the laser beam used in the laser marking process is smaller than 1000 micro-joule (μ J).

5. (currently amended) The method of ~~reducing-wafer-scratch~~ of claim 3 1, wherein ~~the step of adjusting parameter of the processing operation comprises reducing the step height~~ is reduced to a level below 4 micrometer (μ m).

6. (currently amended) A method of fabricating a shallow trench isolation structure for reducing wafer ~~scratch~~ ~~scratchprocess-of-fabricating-a-shallow-trench-isolation-structure~~, comprising the steps of:

providing a substrate;

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performing a laser marking operation to form a laser mark on the substrate, wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and wherein ~~a parameter~~ an energy of a laser beam of the laser marking operation is adjusted ~~in a manner~~ to reduce a step height of the protrusion compared to that without adjusting the parameter;

forming a patterned mask layer over the substrate;

etching the substrate using the patterned mask layer as an etching mask to form a trench;

forming an insulation layer over the substrate, wherein the insulation layer completely fills the trench;

removing a portion of the insulation layer by performing a chemical-mechanical polishing process; and

removing the patterned mask layer.

7. (currently amended) The ~~methodprocess~~ method of claim 6, wherein ~~step of controlling the parameter of the laser marking operation includes adjusting an~~ the energy of the laser beam used in the laser marking operation to a level below 1000 micro-joule (μ J).

8. (currently amended) The ~~methodprocess~~ method of claim 6, wherein ~~the step of controlling the parameter in the laser marking operation comprises reducing the step height~~ is reduced to a level below 4 micrometer (μ m).